

## National Mapping Program

Subactivity	FY 2000 Estimate	Uncontrol. & Related Changes	Program Changes <sup>1</sup>	FY 2001 Budget Request	Change From FY 2000
Mapping Data Collection and Integration	56,330	+228	+10,769	67,327	+10,997
Earth Science Information Management and Delivery	34,270	+641	+2,000	36,911	+2,641
Geographic Research and Applications	36,117	+727	+14,200	51,044	+14,927
<b>Total Requirements \$000</b>	<b>126,717</b>	<b>+1,596</b>	<b>+26,969</b>	<b>155,282</b>	<b>+28,565</b>

<sup>1</sup> See Program Change section for details.

## Activity Summary

### Introduction

Easily accessible, nationally consistent maps and images of the Earth's surface are critical to making informed decisions about complex natural resource, environmental, and hazards issues, as well as public land management, emergency response, urban planning, and public health issues facing all segments of the Nation. Building on 120 years of cartographic and geographic expertise as the lead Federal agency for civil mapping, the USGS ensures a nationwide geographic information knowledge base by providing:

Accurate and comprehensive information about the location and relations among natural and constructed features at or near the Earth's surface . . .

### **GEOSPATIAL INFORMATION**

. . . is fundamental to wise economic and physical development, land-management decisions, protection of resources, and response to and mitigation of damage from natural hazards.

- Map and geospatial data coverage for the entire Nation,
- Satellite and aerial imagery,
- Elevation, hydrography, land cover (e.g., urban, rural, forested), and boundary layers,
- Leadership in the development of the National Spatial Data Infrastructure,
- Global leadership in acquiring, managing, and using land resources observation technology and satellite data,
- Research to advance the understanding of geography, cartography, and geospatial information science, including assessments, analyses, and decision-support tools,
- Long-term collection, management, archiving, and access of current and historical natural science data, and
- Development of national and international standards that enable geospatial data to be shared universally.

The USGS National Mapping Program (NMP) fulfills its responsibilities by ensuring the AVAILABILITY, long-term ACCESSIBILITY, and APPLICABILITY of accurate, up-to-date, standardized, and integrated base geospatial information through three subactivities:

**Availability** — The availability of consistent, multipurpose map products on a national scale advances innovative applications for regional and community-based scientific studies and stimulates a wide range of commercial enterprises. The Mapping

Data Collection and Integration (MDCI) Subactivity ensures that the Nation's needs for base geospatial data and map products are met. Developed in concert with the National Spatial Data Infrastructure, these data assist government managers in administering natural resources, protecting citizens and property, and providing efficient public services. The USGS partners with Federal, State, local, and private organizations to reduce duplication of effort and cost for base geospatial data used in both the public and private sectors.

### AVAILABILITY

*Up-to-date creation and maintenance of key national data bases*

**Accessibility** — Citizens, businesses, and government agencies are demanding greater and faster access to the burgeoning collection of natural science data generated by USGS and other agencies and partners. By using the latest

information delivery technology, the Earth Science Information Management and Delivery (ESIMD) Subactivity provides simple and easy access to a wide variety of maps and natural science information electronically and through a national network of Earth Science Information Centers. To serve the public as an authoritative and reliable national repository for current and historical Earth and natural science information, the USGS also maintains critical nationwide map and imagery archives and geospatial data bases and supports the National Geospatial Data Clearinghouse.

### ACCESSIBILITY

*Long-term archiving and rapid delivery of maps and natural science data and imagery*

**Applicability** — Research conducted under the Geographic Research and Applications (GRA) Subactivity contributes to the informed management of the Nation's natural resources and to the solution of critical societal problems through the use of more effective ways to apply

science to decision-making. In collaboration with Federal, State, local, academic and private sector partners, this program improves the understanding of physical and social processes that influence the earth by developing and applying the latest geographic, cartographic, and information science to promote the use, integration, and interdisciplinary analysis of geospatial data and information.

### APPLICABILITY

*State-of-the-art research to improve understanding of geographic processes, methods, and geospatial information technology*

For more information on USGS National Mapping Program current activities go to <http://mapping.usgs.gov>.

## Federal Role and Key Trends

National Mapping Program activities of note for the next decade are to:

- Lead efforts to build the National Spatial Data Infrastructure and increase the involvement of the private sector, States, and communities in producing and distributing geographic data. Provide techniques for the rapid and effective integration and application of geospatial, natural science, and socio-economic data such as (1) classified data for use by civil agencies as appropriate to achieve their missions and (2) natural hazards information for use by disaster and emergency response agencies and public officials,

- Provide continuing leadership for the U.S. land resource observation program of natural science data acquisition, preservation, and application, and develop innovative long-term strategies for maintaining natural resources data archives,
- Provide new understanding of land cover change and other earth surface processes to aid public and private decision making,
- Build on technological advances in collecting, managing, archiving, and distributing satellite and imagery data,
- Improve the seamless integration of geospatial data, such as the National Elevation Dataset
- Apply relevant computer and telecommunications technology to broader use of geographic information systems, three-dimensional visualizations of land forms, and expert systems to interpret aerial photography and satellite imagery,
- Continue advances in quick delivery of geospatial products to all customers and improve customer interaction, dialogue, and satisfaction at all levels,
- Develop standards to ensure compliance with national, international, and open GIS specifications.

#### ***Mapping Applications Around the Nation***

USGS geospatial data are fundamental to broad, regional studies and to essential governmental activities such as PUBLIC LAND MANAGEMENT, EMERGENCY RESPONSE, URBAN PLANNING, and HEALTH ISSUES. Recent applications include:

- Providing maps and data to officials in San Antonio, Texas, in response to devastating floods from Hurricane George.
- Providing maps and map data to the Georgia Emergency Management Department during the Okefenokee Swamp fires.
- Providing maps and data to the Bureau of Land Management for Arizona and California in wildfire containment efforts.

**National Spatial Data Infrastructure (NSDI)** — A major focus of USGS mapping activities for the next decade is to champion the building of an NSDI that enables governments, industry, the public, and academia to cooperatively produce and share geospatial data. The NSDI encompasses the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data nationwide. A robust NSDI will make accurate and timely geospatial data more readily available for solving community and national problems and support applications in areas such as transportation, community development, agriculture, emergency response, and environmental management, and at a reasonable cost with minimum duplication of effort. Key roles for the USGS in the NSDI are to –

- Ensure national standards for sharing and documenting base geospatial data,
- Assist in defining and implementing a geospatial data framework,
- Promote and participate in cooperative ventures and data sharing arrangements for geospatial data,
- Participate in the National Geospatial Data Clearinghouse, which is a distributed network of geospatial data producers, managers, and users linked electronically, and

- Develop and make available the knowledge and the tools to apply spatial data to solve societal problems.

**Federal Geographic Data Committee (FGDC)** — The FGDC, established by OMB Circular A-16 and chaired by the Secretary of the Interior, comprises 17 Federal agencies that produce and use geographic data. The USGS provides executive staff support to the FGDC, which coordinates the Federal government's development and implementation of the NSDI through partnership programs with State, local, and tribal governments, private industry, academia, and professional societies. The FGDC has formal recognition agreements with 32 State geographic information councils and coordinates NSDI activities with organizations such as the National States Geographic Information Council, National Association of Counties, National League of Cities, International City/County Management Association, University Consortium for Geographic Information Science, Intertribal GIS Council, and Open GIS Consortium. Web site: <http://www.fgdc.gov>. Major NSDI goals to be achieved by FGDC partnership efforts are to:

- Increase the awareness and understanding of the vision, concepts, and benefits of the NSDI through outreach and education,
- Develop common solutions for discovery, access, and use of geospatial data in response to the needs of diverse communities,
- Accelerate standards development and agency implementation to facilitate data development, sharing, and use.
- Use community-based approaches to develop and maintain common collections of geospatial data for sound decision-making, and
- Build relationships among organizations to support the continuing development of the NSDI.
- Increase private sector awareness and build processes and programs supporting private sector growth in participation in the NSDI.

**National Civil Applications of Classified Data** — In 1968, the USGS pioneered the application of classified overhead imagery in the preparation and revision of the Nation's topographic maps. Since 1975, on behalf of the DOI, the USGS has chaired the Civil Applications Committee (CAC), chartered by the Office of the President, to coordinate and assist civil Federal use of classified collections, including environmental and remote sensing applications central to civil Federal agency missions. Examples include monitoring volcanoes; early detection of forest fires; emergency response to natural disasters, such as landslides, earthquakes, droughts, and floods; monitoring ecosystems; and wetlands mapping. Classified data activities are managed through the National Civil Applications Program (NCAP), which supports Federal civil programs related to the use of classified data such as early detection of wildland fires and mapping of active fires. The program focuses on enhancing capabilities to permit near real-time use of classified data in protecting the Nation's health, safety, and environment, to manage Federal lands and resources, and to support economic growth and development. The program has evolved to encompass hazards and disaster response, archive and data dissemination, environmental research, and customer development.

## Customers and Partners

*Customers* — The USGS coordinates mapping activities with stakeholders from Federal agencies, State and local government, academia, and private industry. Forums such as interagency committees, technical working groups, State mapping and GIS councils, cooperator and business partner workshops, and professional conferences provide up-to-date assessments of program performance that are used strategically in decisions to enhance products, program management, and strategic direction. The USGS informs citizens of the value of maps, geospatial data, and earth science information by conducting outreach and customer research.

Public outreach includes —

- Providing lectures and educational materials to school groups, youth and civic organizations,
- Conducting facility tours and sponsoring open house events for the public,
- Demonstrating the use of USGS products at fairs, trade shows, and conventions, and
- Partnering with the Native American community in geographic information system activities and educational support.

Customer research activities include —

- Developing World Wide Web tools to encourage customer feedback on USGS products and services
- Analyzing map user information from surveys performed both in-house and in cooperation with the International Map Trade Association,
- Working with private industry to evaluate public interest in new map products and technologies, and
- Receiving input from retailers of USGS products on the use of products purchased.

### ***Mapping with Pennsylvania***

1999 marked a century of cooperation between the USGS and Commonwealth of Pennsylvania in topographic mapping of the State. We are jointly developing a 5-year data maintenance plan to define future cooperative activities for geospatial and mapping data.

Customer feedback is obtained from stakeholder workshops and conferences; over-the-counter and call-in customers at USGS Earth Science Information Centers; general public users of the electronic National Atlas of the United States; NASA, other government agencies, the commercial sector, and other satellite data customers; and comment cards returned by purchasers of USGS maps and reports. Customer outreach and research increase public awareness of USGS products and services, assist in monitoring trends in map product usage and purchase, and provide feedback on the quality and applicability of USGS products and services, which is then incorporated in technical, program, and strategic decision making.

*Partnerships* — Sharing responsibility for data collection, maintenance, and distribution reduces costs and increases the quantity of data for all participants. Partnerships serve the strategic goals of long-term collaboration and data integration with partner organizations to build and maintain the NSDI. The USGS coordinates directly with partner agencies by collocating liaison

## National Mapping Program

---

offices at regional, State, and local levels. Other USGS mapping program partnership activities and benefits include:

- **Business Partners** — To move from a retail to a wholesale environment, the USGS enlists the private sector to distribute a growing range of products.
- **Innovative Partnerships** — To ensure geospatial data availability and to support NSDI, competitively awarded funding is provided to non-Federal partners for the cooperative production of digital data.
- **Cooperative Research and Development Agreements (CRADA)** — The USGS has agreements with the private sector related to the cartographic, geographic, and information sciences. The Federal Technology Transfer Act of 1986 made technology transfer the responsibility of all Federal scientists and engineers and gave Federal agencies the authority to enter into CRADA with the commercial sector.
- **NSDI Framework Partnerships** — To build the NSDI, the USGS partners with non-Federal organizations to help coordinate the activities of the geospatial data community to provide common data themes, such as elevation, hydrography, boundaries, and digital imagery.
- **NSDI Cooperative Agreements Program** — To advance the development, coordination, and awareness-of the NSDI this program develops clearinghouses and standards for geospatial data, implements educational programs, and builds relationships to promote data sharing among participant organizations.

### ***Benefits of Cooperative Research Agreements***

<b>Partner</b>	<b>Benefit</b>
Microsoft Corporation	A general-public web site and server, "The TerraServer," for displaying and browsing USGS digital images and maps. The online image atlas is free for browsing by anyone with a standard computer.
Chicago Map Corporation/ LEXON Technologies, Inc.	Consumer-oriented map and data products of the National Atlas of the United States and improved access to multiple agency data sets.
ESRI	Improved geospatial data access, management, and distribution tools for scientists, resource managers and the public.
Pictometry, Inc.	Collaboratively produced shaded-relief 3-D images using enhanced USGS DOQ images with numerous public and private sector applications.